

WHAT IS CLAIMED IS:

1. An optical cross-connecting device for switching wavelength multiplexed signals input from a plurality of optical fibers, comprising:

5 switching means for switching per only wavelength group for a part of a plurality of said wavelength multiplexed signals.

2. An optical cross-connecting device as set forth in claim 1, wherein said switching means switches per wavelength signal
10 only for a part of wavelength group after switching per said wavelength groups.

3. An optical cross-connecting device as set forth in claim 1, wherein said switching means comprises:
15 a first optical switch for switching per the wavelength multiplexed signal for the wavelength multiplexed signals input from a plurality of said optical fibers;

first wavelength group demultiplexers for dividing a part of a plurality of wavelength multiplexed signals output from
20 said first optical switch into a plurality of wavelength groups; and

second optical switches for switching per wavelength groups for the divided wavelength groups.

25 4. An optical cross-connecting device as set forth in claim

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3, wherein said switching means further comprises:

wavelength demultiplexers for dividing a part of a plurality of said wavelength groups into individual wavelength signals output from said second optical switch; and

5 third optical switches for switching per wavelength signal and adding/dropping for individual wavelength signals output from said wavelength demultiplexers.

10 5. An optical cross-connecting device as set forth in claim 4, wherein said switching means further comprises:

wavelength multiplexer for multiplexing individual wavelength signals output from said third optical switches into wavelength groups to input to said second optical switches; and

15 first wavelength group multiplexers for multiplexing wavelength groups other than said part of the wavelength groups output from said second optical switches into single wavelength multiplexed signal to input to said first optical switch.

20 6. An optical cross-connecting device as set forth in claim 5, wherein said wavelength demultiplexers, said third optical switches and said wavelength multiplexers are provided only for particular kind of wavelength group among a plurality of wavelength groups output from said second optical switches.

7. An optical cross-connecting device for switching wavelength multiplexed signals input from a plurality of optical fibers, comprising:

switching means for performing switching per wavelength group for a plurality of said wavelength multiplexed signals and switching per only wavelength group for a part of a plurality of wavelength groups after switching.

8. An optical cross-connecting device as set forth in claim 1, wherein said switching means comprises:

first wavelength group demultiplexers for dividing wavelength multiplexed signals input from a plurality of said optical fibers into a plurality of wavelength groups;

second optical switches for switching per wavelength group for a part of a plurality of divided wavelength groups;

wavelength demultiplexers dividing a part of said wavelength groups output from said second optical switches into respective of individual wavelength signals; and

third optical switches for switching per wavelength signal and adding/dropping for the individual wavelength signals output from said wavelength demultiplexers.

9. An optical cross-connecting device as set forth in claim 8, wherein said switching means further comprises:

wavelength multiplexers for multiplexing the individual

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wavelength signals output from said third optical switches into wavelength groups to input to said second optical switches; and

first wavelength group multiplexers for multiplexing
5 wavelength groups other than a part of wavelength groups output from said second optical switches into single wavelength multiplexed signal.

10. An optical cross-connecting device as set forth in claim
10 5, wherein said switching means comprises:

first wavelength converters for converting each individual wavelength signal output from said wavelength demultiplexers into a wavelength signal of the same wavelength and inputting to said third optical switches; and

15 second wavelength converters for converting a plurality of wavelength signals of the same wavelength output from said third optical switches into wavelength signals of different wavelength to output to said wavelength multiplexers.

20 11. An optical cross-connecting device as set forth in claim 5, wherein said switching means comprises:

electrical switches as replacement for said third optical switches;

optical receivers for converting individual wavelength
25 signals output from said wavelength demultiplexers into electric

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signals to input to said electrical switches; and

optical transmitters for converting individual electric
signals output from said electrical switches into individual
wavelength signals and outputting to said wavelength
5 multiplexers.

12. An optical cross-connecting device as set forth in claim
1, wherein said switching means comprises:

10 a first optical switch for switching per the wavelength
multiplexed signal for the wavelength multiplexed signals input
from a plurality of optical fibers;

first wavelength group demultiplexers for dividing
wavelength multiplexing signals input from a plurality of said
optical fibers into a plurality wavelength groups having first
15 granularity;

second optical switches for switching per wavelength group
for said wavelength groups having said first granularity output
from said first wavelength group demultiplexers;

20 second wavelength group demultiplexers for dividing a
part of a plurality of wavelength groups output from said second
optical switches into a plurality of wavelength groups having
a second granularity smaller than said first granularity;

fourth optical switches for switching per wavelength group
for a part of a plurality of wavelength groups output from said
25 second wavelength group demultiplexers;

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wavelength demultiplexers for dividing a part of plurality of wavelength groups output from said fourth optical switches into respective indicative wavelength signals; and

third optical switches for switching per wavelength signal
5 and adding/dropping for individual wavelength signals output from said wavelength demultiplexers.

13. An optical cross-connecting device as set forth in claim 12, wherein said switching means further comprises:

10 wavelength multiplexers for multiplexing individual wavelength signals output from said third optical switches into wavelength groups having said second granularity to input to said fourth optical switches;

second wavelength group multiplexers for multiplexing
15 wavelength groups other than a part of wavelength groups output from said fourth optical switches into wavelength groups having said first granularity to input to said second optical switches; and

first wavelength group multiplexers for multiplexing the
20 wavelength group other than said part of the wavelength groups and output from said second optical switches into single wavelength multiplexed signals to input to said first optical switch.

25 14. An optical cross-connecting device as set forth in claim

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3, wherein, in said first, second and third optical switches, optical fibers not required switching are aggregated into a group for performing switching per group.

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